

# Maple Syrup Digest



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# MAPLE SYRUP DIGEST

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**ROY S. HUTCHINSON**

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**Phone: 603-783-4468**

**Fax: 603-783-9953**

**Email: mapledigest@tds.net**

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### NAMSC COORDINATOR

**Michael A. Girard. . . . . 860-658-5790**

352 Firetown Rd., Simsbury, CT 06070

Email: mgirard@simscoft.com • Fax: 860-408-4667

---

### FIELD EDITORS

**Conn. . . . . John Trumbull—860-379-7312**  
479 Town Hill Rd., New Hartford, CT 06057

**Indiana . . . . . Steve Deatline—765-874-2170**  
7773 S 100 East, Lynn, IN 47355

**Maine . . . . . Al Bolduc—207-265-2600**  
1100 Middle Rd., New Portland, ME 04961

**Mass. . . . . James Graves—413-625-9066**  
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10304 94th Ave. No. Maple Grove, MN 55369

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427 Tice Road, Mainesburg, PA 16932

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4518 Highway T, Egg Harbor, WI 54209

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# GREETINGS FROM YOUR PRESIDENT



As our 2005 North American Maple Syrup Council meeting is fast approaching we need to reflect on the past year and we need to look forward to next year.

The 2005 maple syrup crop varied depending on where you were located. In most areas the season was late and short. However, the quality of maple syrup was excellent leaving a shortage of the darker grades. Next year should be a challenge for the maple producers with skyrocketing fuel costs. We must strive to become more efficient.

The markets for maple syrup continue to grow. The exciting trend that is emerging is to see young people looking for maple products. These people will be maple users for a long time. We need to be confident that people are willing to pay higher prices so that we can maintain our profit margin.

We have just finished our festivals and fairs here in New York State with record sales despite smaller crowds and higher gas prices. Maple syrup and the increasing variety of maple treats bring back our customers year after year. How many times do we hear "I come to the fair every year for my maple"?

It has been a pleasure and an honor to serve as your president over the past two years. As the gavel is passed to our new officers we continue to need the support of each and

every sugar maker in the United States and Canada.

I look forward to seeing all of you at the council meeting in Quebec.

Roger C. Sage  
President

## COMMENTS FROM THE EDITOR:

In the fall Michigan Newsletter a woman wrote in to say she was having a problem making candy. The problem being that it didn't harden, was taffy like. T.D. responded that the Maple Syrup Producers Manual said to cook the syrup to 248 degrees. I am no expert at making candy but over the last forty years I have made thousands of lbs. of candy and never have I cooked it to 248 degrees. When I first started and stirred it by hand I cooked it to 238 degrees. Now I use a candy machine and I cook it to 240-242 degrees and never had a problem. I always use light amber syrup and light amber syrup seems to have the right amount of invert sugar. I suspect her problem is more of an invert sugar problem than a temperature problem.

If she used the fondant method of making candy instead of stirring and pouring, she might have more control of the finished product.

I always like to mention the fact that without our advertisers, we would not be able to publish the Digest, so continue to support them, and they will continue to support the Digest.

Look forward to seeing old friends in Trois Rivers.

Roy

# IMSI NEWS

*By Larry Myott  
Executive Secretary*

The Quebec planning committee has been working hard for many months to prepare for the annual meetings of the IMSI and NAMSC. We look forward to attending and once again participating in these sessions. There is so much to learn about our industries from the research reports, attending the general sessions, participating in the tours, and of course seeing the latest in technology at the trade show.

This is the first time that Quebec has hosted the joint annual meetings, I attended the last Quebec hosted annual meeting of the IMSI (1986) when David Marvin of Vermont was the chair. That was my introduction to the IMSI and its workings. This year marks the 30th Anniversary of the founding of the IMSI to "serve the international maple industry as an open forum for the discussion of industry and government policies, at all levels, and to bring about greater uniformity in the customs and usage of those engaged in the maple syrup industry."

The IMSI has been instrumental in many facets of industry development, including serving as a cop on the corner, to watch for adulteration and other methods of attempted cheating by unsavory characters. Currently an IMSI committee has been studying organic certification and how this program is used within the industry, including current standards. This international committee is working to get the information needed to attempt

standardization on a world market basis.

The IMSI is sponsoring consumer research by Centre Acer (Quebec) on how consumers see maple syrup and the current grading systems. As this IMSI work continues, in an attempt to develop a standardized grading system for the international markets, this work is very important. The work will provide a body of data to help designate a standardized set of maple flavor descriptors.

For several years the IMSI has sponsored a maple syrup contest for packers and gift shop producers. Although those who participated felt that it was a viable contest and worthwhile, participation never was very strong. There will not be an international maple syrup contest in 2005 for packers and gift shops. Perhaps another idea will develop for promoting our continued quality products.

The Lynn Reynolds International Maple Leadership Award will be presented at the joint IMSI - NAMSC banquet at Three Rivers, Quebec on October 26. This award was developed eight years ago after the untimely death of Lynn Reynolds a former president of the IMSI and NAMSC. At the time of his death he was Executive Secretary of the IMSI. Nominations have been solicited by the IMSI Board of Directors. The criteria for nominating is that the nominee must have been active in the international maple industry within the last five years. Further, the nominee must have been a major influence in the international industry leadership over an extended period of time.

# MAINLY MAINE

*By Alfred Bolduc*

Hi there, Maine Maplers! By the time you read this, fall foliage will be vibrant and (we hope) foliage traffic heavy. As I write, gas prices are sky high and rising. Best to check your syrup inventory. Product is tight all across the maple states and Christmas sales are not far behind the foliage season demands. So lock up what you need NOW. With gas prices what they are, prospecting for a drum here and a drum there will be an expensive proposition. However, the future is rosy thanks to added taps and great upgrades. Several large bushes in northern Somerset have been bought up and the younger generation is coming on strong. The land resolution there is now stable with ten year leases and renewable clauses now in the signature phase.

For fifty years (1956-2006), Bob Smith has devoted his time and energy, not to mention personal finances to the Maine maple industry and the international maple arena. Now he is stepping down as a Director of the North American Maple Council. Jeremy Steeves has been selected to replace Bob as Director; Al Bolduc as alternate. It will take both of us to even begin to fill his shoes. Our hats are off to you, Bob, and our hearts go with you and Barbara as you slow down a bit after fifty years of yeoman service to the industry. His sugarbush in northern Somerset County is for sale. It lacks for nothing: a turn key operation. Hook onto this one before

it's too late. (call Al Bolduc at 207-265-2600)"

For those of you who have occasion to travel back and forth to Canada, the Homeland Security Act and Border Patrol and Immigration will be tightened up as of January 1, 2008. **EVERYONE MUST HAVE A PASSPORT.** No more crossing back and forth as we have in the past. All you have to do is cough up approximately \$90, find/acquire an original birth certificate (if you can't find yours you can get a certified copy from the town clerk in the town where you were born.) and procure assistance from a probate court or post office to send it to the National Passport Center. The whole process takes 6 weeks more or less.

Fair season is upon us. Our various maple organizations are in attendance, carrying the word and selling the products. Maine fairs start in July and culminate with the Fyeburg Fair in October. Maine Maple Producers' Association has been given the go ahead to formulate plans for a large sugar house on the Franklin County Fair Grounds in Farmington. Too late for this year, but look for it September 2006.

I had the pleasure of attending Southern Maine Maples' annual barbecue and picnic at the Merrifield's farm in Gorham last month. It was a very pleasant social occasion and a number of maple issues were addressed. The needs and assignment of the Cumberland Fair Sugar House were considered along with a more general discussion about financial directions. Their future looks strong and bright. Are stronger alliances a possibility? Probability?



Perhaps. Charting new directions is slow work, but usually beneficial to all concerned.

The Maine Somerset County Sugarmakers Association annual meeting in June was a great success. A large turnout enjoyed Aubry Davis' (Director of the New England Agricultural Statistics Service, USDA) comprehensive graphs and statistics. Mark Bigelow, Chief of Operations of Maple Grove, St. Johnsbury, VT was in attendance to propose a marketing plan for producers willing to make long term commitments for future production. The plan was well received and we voted to elect a committee to work with Maple Grove next year. Maine Maple Specialist, Kathy Hopkins spoke on adulteration of syrup and the need for members to police themselves. This engendered serious discussion. The meeting concluded with a buffet of gargantuan proportions. Alain DuPlessus, owner of the Four Seasons Restaurant, Jackman, ME outdid himself. We thank him for this and for his long standing provision of space for our monthly meetings.

In closing I want to dedicate this column to Albion Tracy who died this summer. His roots are deep in Maine maple history. The Tracys have been farming and mapling in Farmington for more than 200 years. I would like to think Albion and his famous team are gathering sap from endless rows of large girth perfect maple trees.

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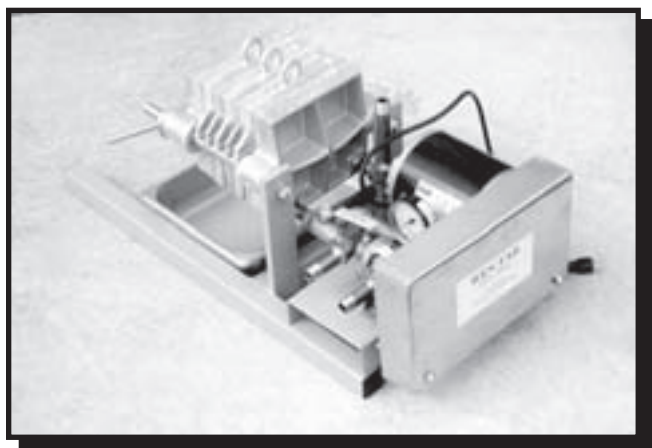
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# MAPLE SYRUP PRODUCTION DOWN 18 PERCENT NATIONWIDE

## UNITED STATES

The 2005 United States maple syrup production totaled 1.24 million gallons, down 18 Percent from 2004. The number of taps was estimated at 7.10 million, up two percent from the 2004 total of 6.96 million, while the yield per tap was estimated to be 0.175 gallons, down 19 percent from 2004. Vermont led all States in production with 410,000 gallons, a decrease of 18 percent from last season. Maine's production, at 265,000 gallons, decreased 9 percent from 2004. Production in New York at 222,000 gallons, is 13 percent below 2004. Production is down 50 percent in Wisconsin, 31 percent in New Hampshire, 27 percent in Michigan, 20 percent in Massachusetts, 12 percent in Ohio, and 9 percent in Connecticut from last season. Pennsylvania, the only State with increased production, is up 2 percent from 2004. An increase in taps in most States was more than offset by a decrease in yield causing production to decline. Temperatures in the maple producing States were generally unfavorable for good sap flow and syrup production in 2005. Most of these States experienced weather that was too cold for sap flow. On average, the season lasted approximately 24 days in 2005 compared to 30 in 2004. Pennsylvania had the earliest sap flow in 2005 with an approximate season opening day of January 20. New York had the latest sap flow in 2005 with an approximate season ending date of May 1. Sugar content of the sap for 2005 was higher than last year. Approximately 40 gallons of sap was required to produce one gallon of syrup. This compares with 42 gallons in 2004 and 41 gallons in 2003. More light syrup was produced than last year but overall most syrup produced was of medium color. The 2004 United States average price per gallon was \$28.40, up \$0.10 from the 2003 price of \$28.30. The United States value of production, at \$42.8 million for 2004, was 20 percent above 2003. The average price per gallon increased in Connecticut, Massachusetts, Michigan, New York, Pennsylvania, and Wisconsin, with Maine, New Hampshire, Ohio, and Vermont showing price decreases.

**NEW ENGLAND** (excluding Rhode Island): In New England maple syrup production for 2005 totaled 782,000, down 16 percent from last year. Vermont remained the largest producing State in New England and the Nation, with 33 percent of the Nation's maple syrup. Taps in New England totaled 4.1 million, up 1.0 percent from last year and making up 58 percent of the Nation's maple taps. The 2005 maple season was rated too cool in temperature, causing production decreases in all five New England states. Temperatures were reported at 57 percent too cool, 22 percent too warm, and 21 percent favorable. The season started late because it was too cold and then warmed up too fast. Earliest dates for each State were as follows: New Hampshire – February 1,

Connecticut and Massachusetts – February 2, Vermont – February 4, and Maine – February 14. Latest closing dates were Connecticut – April 15, Massachusetts – April 19, New Hampshire – April 23, Maine – April 29, and Vermont – April 30. The sugar content of the sap was average, requiring 40 gallons of sap to produce a gallon of syrup. The majority of the syrup produced was medium amber followed by light amber and then dark syrup.

## 2004 PRICES AND SALES

Across New England, the average equivalent price per gallon for 2004 maple syrup varied widely depending on the percentage sold retail, wholesale, or bulk. The 2004 all sales equivalent price increased \$3.10 in Connecticut to \$51.70 and \$4.40 in Massachusetts to \$46.30. The price dropped \$3.10 in Maine to \$19.40, \$7.60 in New Hampshire to \$35.40, and \$0.50 in Vermont to \$27.30. Maine's price continues to be lower than the other States due to the high percentage of bulk sales within that State. New England's 2004 gallon equivalent price of \$26.87 reflects a decrease of \$1.09 from the 2003 price of \$27.96.

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## **NAMSC Research Fund needs your support!**

The NAMSC Research Fund receives more worthy, important project funding requests than there are funds to distribute. Regardless of the amount of syrup you produce, the research projects address common issues that affect all of us: tree health, insect infestation, product quality and production efficiencies – from tree to finished product, and a host of other concerns vital to maple's future. Many already participate but we need everyone's help since the fund depends solely on contributions.

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# New Tapping Guidelines

*By Brian F. Chabot, Professor,  
Cornell University  
Ithaca, NY*

A previous publication described the history of tapping guidelines in relation to tree diameter (Chabot 2004). There are several guidelines that exist (Koelling and Heilgmann 1996, Guay 1999). All recommend not tapping trees below a certain size and all permit more taps in larger trees. Here I explain why maple producers should know the growth rate of trees in addition to diameter to determine the number of tapholes per tree.

Existing guidelines suggest limiting the number of tapholes per tree to protect tree health. A better reason for limiting number of tapholes is to allow the tree to put new wood over the old taphole and thus avoiding tapping into old tapping compartments. Reducing the number of tapholes per tree to allow enough time to produce new wood is less well understood.

## IMPORTANT FACTORS TO CONSIDER

Each taphole permanently damages tree tissue in an area around the taphole. Thus, to determine the productive number of tapholes a producer should use, the important information required is: usable circumference, the growth rate of the tree, and taphole depth. Some of these factors were introduced by McIntyre (1932) and Buzzell (1987), but have been forgotten in current publications. Guay (1999) recognized the impor-

tance of these variables in developing modified guidelines based on tree diameter. Gaston Allard (2004 pers. communication) includes these and other variables when he predicts the long-term impact on sap yield of different tapping approaches.

Although diameter and circumference relate to each other, producers need to know the tapping space on the surface of the tree. Circumference measures tapping space more directly than diameter. This is especially the case if one side of the tree is used preferentially, if there are damaged areas that need to be avoided, or if more than one tap is used on a tree.

Producers should avoid previously tapped wood, wood that has been "compartmentalized" through the wound healing process. When the tree compartmentalizes the area around a taphole wound, it takes this area out of sap production. The natural chemicals in the wound area can produce off-colors and off-flavors in the sap. The only sure way to avoid previously tapped wood is to place tap holes in a regular sequence around the tree circumference or above or below previous taps and not re-tap in a previously tapped area until enough new wood has been produced to accommodate the usual taphole depth.

## TREE GROWTH RATE AND CIRCUMFERENCE

The radial growth of the tree determines how much time is needed to be able to re-tap the same location. A tree growing 1 inch in radius (2 inches diameter) in 10 years will

require 20 years to accommodate a 2-inch deep taphole at a previously tapped location. Slower growing trees will require more time to grow 2 inches of new wood.

Producers can determine the number of tapholes with a simple calculation. For example, let's use 1 inch as the strip of circumference damaged by each tap hole. This is the strip width used by McIntyre, based on a 0.5 inch hole width with 0.25 inch of colored wood on each side. Smaller tap holes produce less colored wood, but one inch apart is closer than most producers space tapholes. Smith and Walters (1972) determined that it is possible to tap within 1 inch of a previous taphole and not affect sap yield. A 10-inch diameter tree has a circumference

of 31.5 inches. A 10-inch tree, without additional growth, could be tapped for 31.5 years at 1-inch hole spacing before the original tapping point is reached. Although I don't recommend tapping side-by-side, it is easiest to think about these relationships if each new hole is placed one inch from the hole of the preceding season. Placing holes in sequence around the tree would insure that the first hole drilled would have a full 31.5 years to become covered by new wood.

Considering the tree's circumference, rather than diameter, is even more important when the entire circumference is not used. This might happen if one side of the tree is preferred, such as the south face, or if a portion of the trunk is unusable or



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inaccessible. Using only part of the circumference for tapping increases the demand on the tree to produce new wood over previously tapped areas. For example, tapping only on the south-facing quarter of the tree circumference will allow for 8 holes 1 inch apart and 8 years of radial growth. No maple tree is growing fast enough in 8 years to produce enough new wood to accommodate a 2-inch deep taphole in a restricted tapping space.

Increasing the distance between taps reduces the time it takes to get around the tree and reduces the amount of new wood over the previously tapped area. Two-inch taphole spacing on a 10-inch diameter tree will return to the starting point in 15-16 years. Few if any maples above

10-inch diameter are growing fast enough in 15-16 years to produce enough new wood to accommodate the usual taphole depth.

Expanding the tapping face vertically so that two or three bands of the circumference are tapped will allow more time for wood growth over the old tap holes in each band. But this means that the producer must design a tapping plan and length of drops to use two or more bands around the tree rather than a single band. Those using buckets have more flexibility in moving the tapping area vertically on the trunk.

#### **GROWTH RATE AND MINIMUM TREE SIZES**

Producers need to know the growth rate of trees to determine

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when a tree has reached a tapable size. For example, a 10-inch diameter tree with 0.04 inch of annual radial growth, the average growth rate of tapped maples at Arnot Forest, will add 1.3 inches of radius in 31.5 years. This amount is much less than the usual tapping depth, which may be between 2 to 3 inches. A 10-inch diameter tree with 0.04 inch radial growth is too small to tap using normal tapping depths. It would be enough if the taphole depth is 1-1.5 inches. A tree with 0.04 inches of annual growth would need to be about 15 inches diameter (47 inches circumference) to produce 2 inches of radial growth during the 47 years of tapping before the starting point is reached. Doubling the growth rate to 0.08 inches per year would produce 2.5

inches in 32 years. So only with the higher growth rate would a 10-inch tree be large enough to support 32 years of tapping at a 1-inch spacing before the starting point is reached, at which point there would be 2.5 inches of new wood to continue tapping within this band. The point is that the growth rate and tap hole depth together determine what size the tree needs to be to support even one hole per year of annual tapping.

Faster growth rates shorten the time required for enough new wood to adequately cover old tap holes. Buzzel (1987) proposed tapping trees with a minimum annual radial growth of 0.125 inches. The 0.125 minimum is well above the growth rate of most trees in most years at the two Cornell sugarbushes and at other sugarbushes in NY that we



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have sampled. Five sugarbushes in Quebec had average annual radial growth rates of 0.03 to 0.05 inches (Guay 1999). So we wouldn't be tapping many trees if Buzzel's guideline was followed.

As seen from these calculations, the growth rate is important in determining how much time it takes to put new wood over the old tapping area. Annual radial growth of a young tree with its canopy fully exposed to light might be 0.2 inch (= 4 inches of diameter growth per decade). Radial growth decreases with increasing tree size, poor sites, and environmental stress. The most generally important environmental stress is reduced light intensity from competition with other trees. Trees in subdominant canopy positions grow significantly more slowly than dominant trees in the same woods and crowded trees grow more slowly than trees without overlapping canopies.

### **TAPHOLE DEPTH AND NUMBER**

As described above, tapping depth also is important in determining the appropriate tree size and taphole number. An annual growth rate of 0.04 inch produces 1 inches of new wood in 25 years and 2 inches in 50 years. A 7.9-inch dbh tree has 25 inches of circumference or 25 years of 1-inch deep tapping at 1-inch spacing. However, at this growth rate a starting size of 15.9 inch dbh would be required for one 2-inch-deep taphole each year.

Guay (1999) recommends varying the tapping depth with tree size. His recommendations are for a 1.6-inch taphole depth with tree growth rate of 0.03-inch radial growth per year

increasing to a 2.4-inch depth for growth of 0.06 inches per year. Annual growth usually decreases as trees get larger so this does not mean that tapholes can be deeper in larger trees.

As demonstrated above, at 0.04-inches of annual radial growth a 10-inch dbh tree is too small to tap unless taphole depth is approximately 1 inch. Similarly, a 15-inch tree with this growth rate is also too small for two tap holes. A 15-inch dbh tree has 47 inches of circumference or 23.5 inches per taphole. Taphole depth would have to be less than 1-inch for 2 holes in a tree this size. A 16-inch tree would be needed for two 1-inch deep tapholes; a 20-inch tree would allow for two tapholes each 1.25-inches deep. It would take a 33-inch dbh tree to support two 2-inch-deep tapholes.

### **NEW GUIDELINES**

Using information about tree growth results in more complex guidelines for tapping. Once growth rates are known within a particular sugarbush, it is possible to calculate taphole depth and spacing, minimum tree sizes for tapping and the number of taphole a tree can accommodate. The purpose of this article is to help the producer to understand the interactions between growth rate, taphole depth, and tree size. However, the simplest guidelines are:

1. No tree should have more than one tap unless it has a high growth rate or is very large. For those with vacuum, this should not be a problem since Tim Wilmot is finding that one taphole is sufficient to remove

much of the available sap in the tree. Those with buckets will collect less sap. However, if the producer is willing to move the tapping area vertically on the tree surface to have more than one tapping band, something closer to the traditional guidelines could be used.

2. Taphole depth should be closer to 1 inch and not more than 2 inches, especially in smaller, slower growing trees. Again, knowing the growth rate of your trees will help you determine the appropriate hole depth for your sugarbush.

3. Expand the taping area vertically by 12-15 inches above or below old tap holes. This increases the likelihood of finding new wood and allows more time for wood growth over old holes.

4. Use a tapping pattern that allows you to know what parts of the tree were tapped for as much as 20 years previously.

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# **11TH ANNUAL NEW YORK MAPLE PRODUCERS WINTER CONFERENCE**

A grower-focused 2006 NYS Maple Conference will provide practical and hands-on information for growers to incorporate into existing and expanding operations. Plans are being made for the 2006 New York State Maple Producers Winter Conference. The Maple Conference will be held in the same great location, the Vernon-Verona-Sherrill High School in Verona, New York on Friday evening January 6th and all day Saturday, January 7th. This central location provides plenty of meeting space as well as room for a large trade show with over 25 exhibitors displaying plenty of specialized equipment for meeting maple producer needs. Session topics include the latest in research and grower experiences regarding maple production, promotion, forest management and the making and marketing of a variety of maple products. This day-and-a-half event has something for every level of maple producer. A maple conference you will not want to miss.

The conference kicks off Friday evening with featured speaker Larry Myott, Executive Secretary of the International Maple Syrup Institute and retired University of Vermont Maple Extension Specialist. He will be relating international developments in the maple industry. Also featured Friday evening, an industry trade show highlighting maple equipment, manufacturers, and vendors is

open from 6:00 PM until 9:00 PM. More than 25 exhibitors are anticipated to display a complete line of maple equipment including evaporators, vacuum pumps, tubing supplies, and value-added processing equipment and supplies.

Saturday's program features 40 of the industry's leading maple experts from throughout North America and Canada presenting some 45 different workshops. These focus on several major areas of emphasis: beginning sugarmakers, new and advanced technologies, marketing, promotion, value-added products, maple tapping and tubing, forest management and a special emphasis this year on the forest tent caterpillar and managing forest pests. During each of five time slots, there will be ten individual workshops presented concurrently throughout the day.

The 2006 value-added product workshops are "Making maple gift baskets," "Making maple cotton," "How we make molded maple sugar," "Beyond maple sugar and cream, the other maple value added products," "Value added products and income at the NYS Fair" and "Adding value to maple products." For beginners and hobbyist presentations include "Making molded maple sugar for the hobbyist," "Simply syrup," "Woodlot basics and tree I.D.," "Hot tips for those new to selling maple syrup," and "When is it really syrup, grading and quality control for the beginner." For those interested in tapping and tubing workshops take in "How we wash tubing," "Basic tubing," "What's new in tubing testing and research," and "Update on spout size." Forest management workshops will focus on

recent insect problems as well as various aspects of forest management including "Ecology and management of the forest tent caterpillar," "Forest tent bio-control," "Principles of forest health," "Lecanium scale," "Principles of thinning you sugar bush," and "Deer in the sugar bush what are my options?." Presentations relating to promoting your maple business include the maple queen contest, "Developing maple food and cooking partnerships," "Working with tourism organizations to promote your maple enterprise," "Working the crowd at farmers markets, fairs and shows," and "Get ready company's coming." Research topics consist of "Flavor grading syrup," "Research topics from Vermont," and "Grading syrup by color - you won't believe what we found."

Other workshops include "UV sterilization of sap," "The new cream machine," "Syrup grading techniques and equipment," "Advanced sugar house management," "Managing buckets efficiently," "Money from more than maple - ginseng in your sugar bush," and "What do the maple survey results tell us about ourselves?." This is just a taste of all the programs offered at this years Maple Conference.

The conference is open to the general public, as well as any maple producer, and is geared toward all levels of sugar makers. Saturday's trade show opens at 8:00 AM with workshops starting at 9:00AM. Held at the Vernon-Verona-Sherrill (V.V.S.) High School, Verona, New York, the conference is sponsored by the V.V.S. FFA in conjunction with the New York State Maple Producers Association and Cornell Cooperative Extension.

The V.V.S. High School is located between Utica and Syracuse, NY on State Route 3, two minutes from NYS Thruway Exit 33. Overnight accommodations are within five minutes of conference site. More information on conference topics and presenters, contact V.V.S. FFA advisor Keith Schiebel at (315) 829-2520 ext. 262, email at [kschiebel@vvs-csd-high.moric.org](mailto:kschiebel@vvs-csd-high.moric.org), or visit the school's website at: [www.vvscentralschools.org](http://www.vvscentralschools.org).

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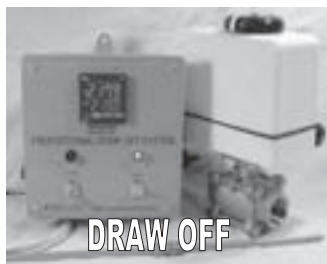
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# AUBREY DAVIS, DIRECTOR OF NEW ENGLAND AGRICULTURAL STATISTICS TO RETIRE

*By Angie Considine  
and Sherry Deane*

On January 3, 2006, Aubrey Davis will retire from the NASS after 39 years of federal service, including two years in the military.

Aubrey was born in Arizona, but grew up on a cotton farm in Central Texas. He graduated from Texas A&M University in January 1967 and immediately started his work with the Statistical Reporting Service (SRS) in Austin, Texas. In less than a year, he reported to Fort Knox, Kentucky, for Officer's Basic Training and then off to Germany for two years. After being discharged from the Army, Aubrey resumed his position with SRS in Austin, until his transfer to Richmond, Virginia. It was there that he met his wife Ruth, who was the Administrative Technician at the time. Aubrey has also worked in Washington, D.C. and NASS's California field office. He was the State Director in Hawaii before accepting a transfer to Concord, NH, in June of 1988. During his time in New England, Aubrey has worked hard to improve the name recognition of New England Agricultural Statistics and NASS and has spearheaded efforts to gain the trust and respect of agricultural producers throughout the region. Aubrey has participated in many NAMSC/IMSI meetings and was a frequent guest at state maple producer association meetings. He enjoyed touring the various maple sugarhouses throughout New England and will miss visiting with the many

producers he has met over the years. Upon retirement, Aubrey is planning a vacation to Hawaii. Aubrey is looking forward to his retirement, specifically enjoying more time with his grandson Drew, visiting his mother in Texas and practicing his golf swing on courses throughout New England.

We invite you to join the New England Agricultural Statistics field office as we honor Aubrey for his contributions to NASS and the agricultural community at a retirement dinner on January 7, 2006. The festivities will be held at The Cat 'n Fiddle restaurant in Concord, NH, beginning with a social hour at 6:00, and dinner at 7:00. The buffet will feature Prime Rib, Seafood Newburg, Baked Stuffed Chicken, potatoes, vegetables, salads, desserts and non-alcoholic beverages. The cost will be \$27.00 per person, including tax and gratuity.

We will be putting together a book of letters to be presented to Aubrey at the dinner. Aubrey's work has affected many people as he has traveled across the U.S. and throughout New England, we would love to present him with the biggest book of letters ever compiled. Please send us a story or note for inclusion in the book of letters. Please send letters of reminiscence unfolded on 8 ½ x 11 inch paper to: NE Agricultural Statistics, c/o Sunshine Club, PO Box 1444, Concord, NH 03302-1444. **For questions contact Angie Considine or Sherry Deane at 1-603-224-9639.**

A block of rooms are reserved at the Holiday Inn, Concord, NH, at \$78.00 (plus applicable tax) under the name of "Aubrey Davis Retirement Party." Call 1-603-224-9534 and make your reservations with the hotel. The deadline at that rate is Dec. 15, 2005.



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# **A HISTORY OF THE GOOSENECK: THE BROWER SAP PIPING SYSTEM AND THE CARY MAPLE SUGAR COMPANY**

By Matthew M. Thomas

The initial application of plastic tubing for gathering maple sap in the 1950s was indisputably one of the most significant technological developments of the maple industry in the twentieth century. However, the first viable tubing system was introduced over forty years earlier as a gravity drawn system made completely of metal. Invented in the shadows of the Adirondack Mountains near Mayfield, New York, by William C. Brower, Jr., the system carried sap directly from the tree to the sugarhouse through an interconnected series of specialized taps, tubes and connectors. Formally known as the Brower Sap Piping System, the pipeline was popularly referred to as the Gooseneck system because one of the key segments of the pipeline resembled the curved neck of a goose.

Born in Mayfield, New York in 1874, Brower was the consummate Yankee tinkerer and inventor. As a machinist, mechanic, and jack of all trades, his education did not come from the classroom, but rather, from trying to solve and improve on the problems and dilemmas he and his neighbors faced every day. Brower was also a sugarmaker, making him well aware of the difficulties of tapping and gathering sap with buckets and teams of

horses or oxen in deep snow and on steep slopes.

After coming up with the idea of using the natural gravity of the mountains to eliminate the laborious task of hand gathering sap, it took Brower nearly three years of trial and error to perfect the system. The initial patent application occurred in December 1914. A year and a half later in June 1916, the United States Patent Office awarded Brower patent number 1,186,741 for his "Sap-Collecting System". Likewise, an identical application by Brower was awarded a Canadian patent in August of 1917.

In order to support the weight of the folded sheet metal tubing and the sap flowing through it, the Gooseneck pipeline was suspended by small hooks on a network of wires strung through the sugarbush supported by posts and trees. The wire used was usually a heavy gauge fence wire or reused telegraph wire. The labor required for set up at the beginning of the season was greater than that of traditional gathering systems using metal spouts, pails and covers; but this cost was easily made up with a reduction in labor for gathering as well as the elimination of sap lost by overflowing buckets that were difficult to tend to in deep snow and on steep slopes.

The pipeline quickly caught the attention of many sugarmaker's in the region; however Brower continued to manufacture the tubing and spiles out of his small workshop, limiting his ability to mass produce the system. According to his grandson, Brower was a man more interested and skilled in working with his hands than in promoting and selling his invention.

Following completion of the

pipeline design in 1914, Brower traveled from his Mayfield home to St. Johnsbury, Vermont to try and interest George C. Cary of the Cary Maple Sugar Company in using the pipeline in the large sugarbush on Cary's 4,000 acre farm. Initially, Cary was not interested, but Brower persisted, finally convincing Cary to try the system on 1500 trees during the 1915 maple season. As president of what was then, the world's largest maple sugar business, and as owner of one of Vermont's largest sugarbushes, Cary had the wealth, liberty, and interest in experimenting with more efficient and cost effective methods and equipment. After only one season of use, Cary was sold, placing an order for enough tubing to connect 9000 more trees. Ultimately Cary would have 15,000 trees on the

pipeline at his North Danville sugarbush.

Continued satisfaction with the system led the Cary Maple Sugar Company to form a partnership with Brower in 1918, with the company providing the facilities and financing to expand production and sale of the pipeline. Although his family stayed in New York, Brower temporarily relocated to St. Johnsbury to direct production in this new venture. According to a promotional brochure, during the first year of production in St. Johnsbury, sales more than doubled and orders were coming in faster than they were able to manufacture the pipeline. The brochure goes on to say that many producers tried a small amount of the tubing at first but were so satisfied that they followed-up with much larger orders.

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Owners of larger sugarbushes were especially interested in the system. In one instance an estimated 30,000 feet of pipeline was used in one 1,700 tap sugarbush.

With mass production in full swing, the 1920 prices for the system ranged from thirty-five to forty-two dollars for one thousand feet of half inch to one inch diameter pipeline, and seven dollars per one hundred for both spouts and Goosenecks. The half inch and one inch diameter pipeline sections came in three foot lengths with a manufacturer' estimated costs of sixty to seventy cents per tree.

An impressive endorsement of the quality of maple sugar one could make using the pipeline came from M.J. Corliss, the Secretary and Treasurer of the Vermont

Sugarmaker's Association. At the annual meeting of the Association in 1926, Corliss noted that he had "been taking careful note and for the last two or three years it is a fact that the men who have carried off most of the blue ribbons or first prizes are the men who have used the piping system". One of the greatest strengths of the pipeline was the elimination of debris and the near immediate delivery of clean, fresh sap, which was especially important in the 1920s and 1930s when and our understanding of bacterial growth in sap and the tap holes was in its infancy and sap gathering was traditionally done with out the aid of engines and machines.

With the Cary Company's assistance and wide reaching influence, the pipeline began to make a dent in the equipment market. While, the

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pipeline system never became as popular as tubing has today, it was added to the sap gathering process in a number of maple operations. A 1925 study of 457 maple producing farms in Vermont found that 18, or roughly four percent, were using the pipeline on some of their trees. In those 18 sugarbushes, an average of 28 percent of the trees were tapped with the pipeline, ranging from as few as 8 percent to as many as 75 percent of the trees. In that same year, pipeline users averaged 400 taps on tubing and had been gathering sap with the system for an average of 4 years. This study also found the average estimated value of the pipeline to be \$268 or 67 cents per tap, which was consistent with the price estimate promoted by the Cary Company.

It is not clear when the Cary Maple Sugar Company discontinued its production of the pipeline; however, it may have been as early as the mid-1920. By the late 1930s, it appears that the Gooseneck system had fallen out of favor and was no longer used by many maple producers. George Cary himself went bankrupt and died in 1931, leading to the reorganization of the company and the sale of his farm and sugarbush. With the end of production of the pipeline in St. Johnsbury, William Brower returned to his family in New York, where he lived until his death in 1940.

The pipeline was used primarily in the northeastern states of Vermont, New York, and New Hampshire; however, the system also made it as far west as Wisconsin. Evidence of its use was recently found in the north-

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ern part of the state on the Chequamegon-Nicolet National Forest. Archaeologists discovered spiles, Gooseneck connectors, rolls of wire, and thousands of sections of pipe from the Brower system at the former location of a late 1920s to early 1930s sugarhouse.

Like plastic tubing, it was important to not have any sag in the system where sap could collect in low spots and get sour. Some pipeline users reported that freezing was sometimes a problem, but that the metal warmed easily when the sun came out, quickly thawing the frozen sap in the pipeline. It was sometimes noted that at the end of the season sap gathered with the system was slightly sour and often had to be thrown away. Fallen limbs, ice, and deer occasionally disconnected sections of the pipeline, and the contraction of the metal in very cold conditions could result in the separation of the inserted pipe ends. Some maple producers stopped using the system because it was made from a kind of sheet metal known as Tern Plate, which was a combination of tin and lead. As one maple bulletin described it in 1949, "the use of such metal was strongly discouraged by State and Federal authorities for the processing of any food". In spite of these drawbacks, the benefits at the time were clear. For sugarmakers with large, steep, and hard to get to sugarbushes who kept their equipment clean and processed their sap quickly, the Gooseneck system was an excellent innovation. While the system added more work at the beginning and end of the maple season with longer set up times and additional cleaning, it

eliminated the laborious task of gathering sap once or twice a day.

Improvements in sap gathering methods have long since replaced the Gooseneck system, but the pipeline has not completely faded into memory. On the Lent family farm near Mayfield, New York, the pipeline continues to be used on a few hundred taps to gather and transport sap from their mountainside sugarbush. It is no coincidence that the family still uses the system or that their sugarbush is near Mayfield, the community where Brower first invented the pipeline. In fact, the Lent family has used the pipeline for over 80 years with their farm and sugarbush located next door to Brower's former property. Many years after his death, the Lent family purchased William Brower's former home and the workshop where the pipeline was invented. Today, a New York State historic marker points out the location of the workshop alongside Mountain Road (Highway 123) northeast of Mayfield.

According to Lent family history, their ancestor, Edward L. Lent, worked with his neighbor Brower in the early 1900s to develop and improve the pipeline system, using the Lent sugarbush as a test site. Over the years the Lent family tried other methods of sap collection like metal pails, plastic bags, and plastic tubing, but has always kept a portion of their sugarbush on the Gooseneck system. At their peak in the 1980s, the Lent's gathered sap with the pipeline from approximately 2500 taps. More recently, they have discontinued commercial production and scaled back their operation to a few hundred taps. The spring of 2004





*The Gooseneck metal sap pipeline in use during the 2005 sugaring season in the Lent Family sugarbush, Mayfield, New York. Copyright Matthew M. Thomas*

was one of the first years that they did not tap, out of respect for the terminal illness and recent passing of the family patriarch, Edward W. Lent, grandson of Edward L. Lent. The 2005 season saw a return to the Lent family installation of the Gooseneck system.

As the preferred method of sap gathering in the modern sugarbush, plastic tubing has become commonplace over the last forty years. However, the basic idea, structure, and terminology of a sap gathering pipeline were established with the Gooseneck pipeline, setting the stage for the experiments with plastic tubing pipelines in the mid-1950s. In fact, one could argue that Brower

would have probably chosen plastic rather than English Tin had flexible plastic PVC tubing been invented and available in the early 20th Century. In a flexible form, PVC tubing wasn't available for non-military use until after World War II. It wasn't until it became commercially available in the 1950s when pioneers like Nelson Griggs, George Breen, and Bob Lamb began to explore its application for gathering maple sap.

Information for this article came from historical research and interviews with members of the Brower and Lent families. Any questions or comments are welcome and should be addressed to Matt Thomas at [maplematt@hotmail.com](mailto:maplematt@hotmail.com).

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*(Taken from  
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# MAPLE SYRUP RECIPES

*By Courtney Donnelly  
St. Lawrence County  
Maple Queen 2005-2005*

## MAPLE EGGNOG

6 eggs  
3/4 cup maple syrup  
2 cups light cream  
2 cups milk

Beat separately the egg yolks and whites, adding 1/2 cup maple syrup to the yolks while beating and 1/4 cup maple syrup to the whites. Mix egg whites with yolks, add cream and milk. Chill thoroughly. Serve with a dash of nutmeg for garnish. Note: 2 ounces of rum and 1 pint of brandy may be added for a more festive drink.

## MAPLE APPLE SAUCE

Tart apples  
1 cup maple syrup  
1/2 cup water

Bring maple syrup and water to a rolling boil in a large saucepan. Fill with cut up apples. Cook only until fork tender for a chunky applesauce.

## MAPLE POPCORN RECIPE

1 cup maple syrup  
1/2 to 1 cup walnut pieces

9 cups popped plain popcorn

Heat the maple syrup over medium heat until syrup reaches 236 degrees F. on a candy thermometer. Lightly oil large mixing bowl, mix popcorn, nuts and syrup with lightly oiled spoon. When mixture cools break off and eat.

Yield: about 10 cups

## MAPLE MILKSHAKE

2 scoops vanilla ice cream  
1 cup milk  
1/2 cup maple syrup

Place ingredients in blender and blend until well mixed or shake all ingredients thoroughly in a tightly covered container.

## MAPLE FUDGE

1 cup maple syrup  
1/2 cup light cream  
2 cups sugar  
2 tablespoons butter  
1 cup walnuts, broken (optional)

Combine all ingredients except the nuts in a saucepan. Stir over heat until the sugar is dissolved. Boil gently, without stirring, to 238 degrees F. or to the softball stage. Cool to luke-warm: beat until the color changes and the candy begins to set. Stir in the broken nuts; turn into a buttered pan; mark in squares when firm.

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## NEW YORK STATE MAPLE PRODUCERS CONFERENCE

January 6 and 7, 2006

Vernon-Verona-Sherrill Central School, Verona, NY

For more information contact:

Keith Schiebel at (315) 829-2520 ext. 262

e-mail: [kschiebel@vvs-csd-high.moric.org](mailto:kschiebel@vvs-csd-high.moric.org)

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## STURBRIDGE AREA MAPLE DAYS

March 17-19, 2006

Sturbridge, Massachusetts

For more information contact:

Lee Schelin at Phone: (508) 347-0210, Fax: (508) 347-0375

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## NAMSC / IMSI ANNUAL MEETING 2005

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1620, rue Notre-Dame, Trois-Rivières (Quebec), Canada G9A 6E5

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For more information, contact the organizing committee at:

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## IN MEMORIAM

### Nelson H. Widrick

Nelson H. Widrick, 89, of Croghan NY, died August 14, 2005. He was the widower of Esther Widrick, and had been in declining health following a stroke three years ago.

He was born near Croghan and spent his life since 1937 at the Widrick Maple and Dairy Farm. In the 1940's he tried also raising turkeys.

He was one of the first members of the NYS Maple Producers Assn., and member and President of the Lewis County Maple Producers Assn. He took the lead in locating bulk markets for neighbors, and often surprised his neighbors with the breadth of his contacts among maple producers and buyers. In 1981, while navigating a flatbed load of bulk syrup to Wisconsin, he wore out a set of chains getting through an early blizzard. He later became one of the most active Directors of the NY Farm Bureau Marketing Committee, and became invaluable in organizing the NNY Maple Producers Co-op. He served on the Advisory Board of the local Key Bank in the 1980's and 1990's, and was very active in the creation and organization of the non profit American Maple Museum, in Croghan NY. He had an amazing recollection of local history.

As an early and busy dealer for Lamb, Grimm, and Beaver River, he generously gave credit and advice to producers inside and beyond NY State. Almost like on Noah's Ark, he could usually go off into the gloom of his garages and find one or two of almost anything a producer could want. He was inducted into the NAMSC Hall of Fame in 1981, and the 1999 NYS Maple Tour booklet was dedicated to him.

Surviving are two sons and a daughter in law, Arlon and Karen, and Willard (of Croghan), two daughters and sons in law, Karen and James Villiere (of Port Leyden) and Patrina and Gregory Ashely (of Lowville), a sister Mabel Mayer (Lowville), nine grandchildren, six great-grandchildren, and numerous nieces, nephews, great nieces, great nephews, and cousins. He was a lifelong member of Croghan Mennonite Church. In his memory, the NYSMP Assn. is making a donation to the American Maple Museum, and the Lewis County Maple Producers Assn. is making a donation to this Museum's Elevator Construction Project.

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